

ABSTRACT OF THE DISCLOSURE

Low resistivity, C54-phase TiSi_2 is formed in narrow lines on heavily doped polysilicon by depositing a bi-layer silicon film. A thin, undoped amorphous layer is deposited on top of a heavily doped layer. The thickness of the undoped amorphous Si is about 2.4 times the thickness of the subsequently deposited Ti film. Upon thermal annealing above 750°C , the undoped amorphous Si is consumed by the reaction of $\text{Ti} + \text{Si}$ to form TiSi_2 , forming a low-resistivity, C54-phase TiSi_2 film on top of heavily doped polysilicon. The annealing temperature required to form C54 phase TiSi_2 is reduced by consuming undoped amorphous Si in the reaction of Ti and Si, as compared with heavily doped polysilicon. Narrow lines ($<0.3\mu\text{m}$) of low-resistivity, C54-phase TiSi_2 films on heavily doped polysilicon are thus achieved.